March 7, 1933. G. LEIMAN **1,900,570**

FURNACE

Filed Nov. 2, 1929

Fig. 1.

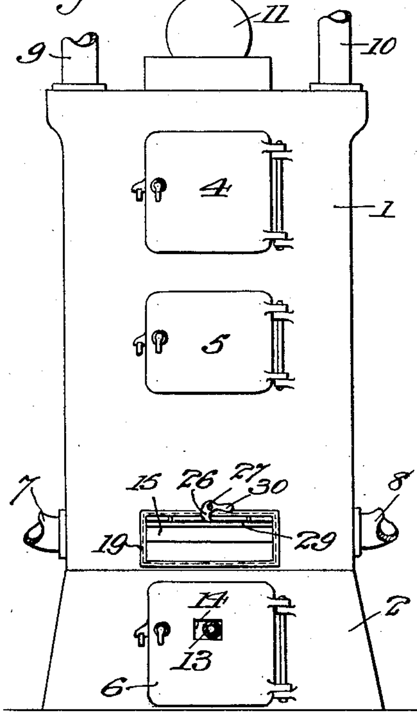


Fig. 2.

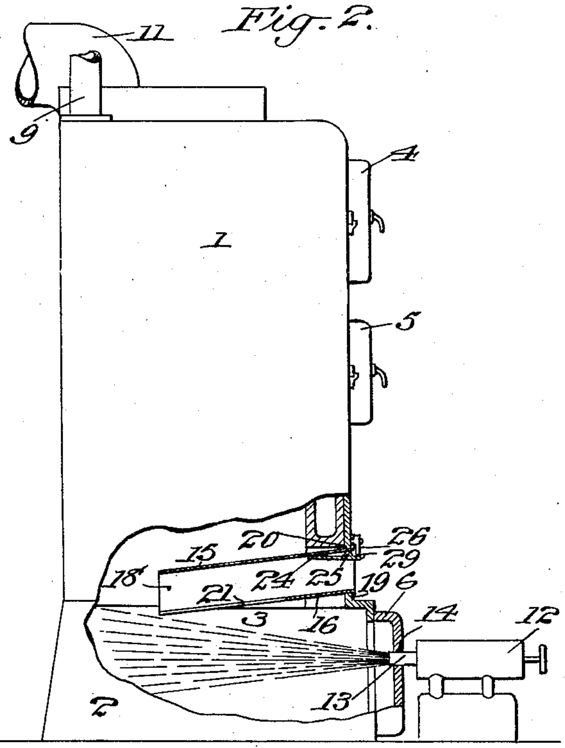


Fig. 3.

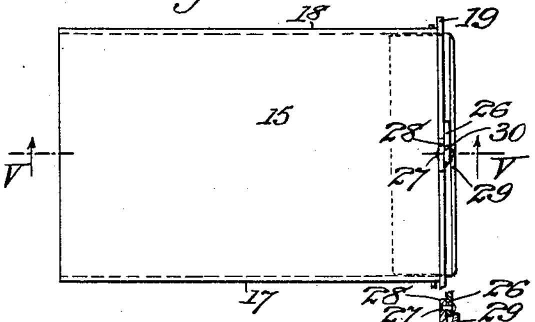


Fig. 4.

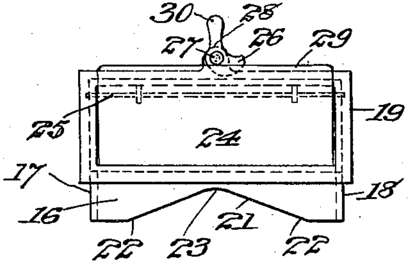


Fig. 5.

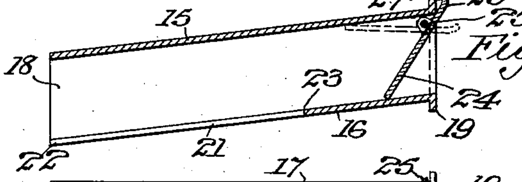


Fig. 6.

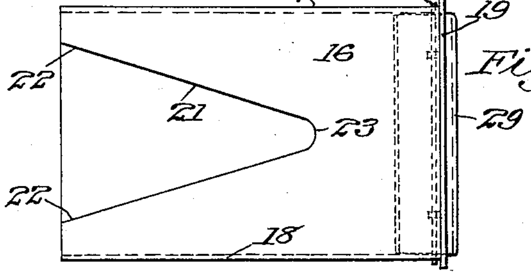
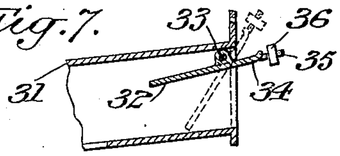


Fig. 7.



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ATTORNEYS

UNITED STATES PATENT OFFICE

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FURNACE

Application filed November 2, 1929. Serial No. 404,284.

This invention relates to improvements in furnaces and more particularly to boilers of furnaces having oil burning devices incorporated therewith.

One object of the invention is to provide an attachment of hollow tubular formation capable of being applied to a boiler above the oil burning device and disposed in position to feed a column of air to the combustion chamber to increase the volume of heat created in the chamber and reduce the noise caused by the operation of the oil burner.

Another object is to provide a hollow tubular attachment having means applied thereto for regulating the volume of air passing therethrough.

Another object is to provide a hollow tubular attachment disposed in an inclined position in the combustion chamber and having its lower wall cut away to direct a current of air toward the flame of the oil burner, thereby obtaining a balanced mixture of the air and fuel in the combustion chamber and assisting in the combustion of the fuel emitted from the oil burner.

Another object is to provide certain improvements in the form, construction and arrangement of the parts whereby the above named and other objects may effectively be attained.

A practical embodiment of my invention is represented in the accompanying drawing, in which—

Fig. 1 represents a front elevation of a boiler having my improved attachment applied thereto and showing a nozzle of the oil buring device in section.

Fig. 2 represents a side elevation of the same, partly in section.

Fig. 3 represents a plan view, on an enlarged scale, of my attachment.

Fig. 4 represents a front elevation of the same.

Fig. 5 represents a longitudinal vertical section taken in the plane of the line V—V of Fig. 3, looking in the direction of the arrows.

Fig. 6 represents an inverted bottom plan view of the same, and

Fig. 7 represents a detail longitudinal vertical section of my attachment having a modified form of shutter pivoted therein.

The furnace may be of any well-known or approved construction having a boiler denoted by 1, a base 2 for supporting the boiler and a combustion chamber 3 therein. The boiler is provided with the usual clean out doors 4, 5, and the base has a door 6. The water inlet pipes for the boiler are denoted by 7, 8, while the outlet pipes are denoted by 9, 10. A smoke pipe 11 is secured to the top of the boiler in the usual manner.

An oil burner 12 of any well-known or approved type having a nozzle 13 is disposed in position with the nozzle projecting through a hole 14 in the door 6, from which nozzle the fuel is ignited and directed into the combustion chamber 3. Air from the exterior of the boiler is allowed to pass into the combustion chamber through a hollow tubular member composed of an upper wall 15, a lower wall 16, and side walls 17, 18. The walls are preferably disposed in rectangular form in cross section, and provided at one end with a peripheral flange 19, by which flange the member is secured in an opening 20 in the boiler 1. The member is inclined downwardly in and toward the rear of the combustion chamber 3, so as to direct the column of air passing therethrough into contact with the fuel. The lower wall 16 of the member has a portion cut away to form a V-shaped opening 21, the walls of which opening are widely separated at 22 and converge to a point 23 located approximately about two-thirds of the distance toward the front of the member. This opening 21 allows a portion of the column of air passing through the member to be directed downwardly onto the ignited fuel emitted from the nozzle immediately below it.

As a means of restricting the column of air passing through the hollow tubular member or to close the passage entirely, I have shown in the present instance, a shutter 24 pivoted at 25 in the side walls 17, 18 and arranged to swing toward and away from the upper wall 15 and lower wall 16, thereby controlling the volume of air passing through the member. The shutter 24 is closed by gravity and opened by means of a cam 26 pivoted at 27 to a lug 28 on the peripheral flange 19. This cam 26 is adapted to engage the upper edge 29 of the shutter 24 and move it downwardly. The cam is provided with a handle 30 by which it is manipulated to bring it into engagement with the upper edge 29 of the shutter. To close or restrict the passage in the member, the cam is rocked on its pivot 27 by movement of the handle 30 away from the edge 29 of the shutter 24, so that the shutter will be allowed to swing, by gravity, on its pivot 25 and cause the edge 29 to maintain its position in contact with the cam.

In Fig. 7 I have shown a tubular member 31 having a shutter 32 pivoted at 33 and provided at its outer end 34 with a rod 35 screw threaded to receive a weight 36 adjustably secured in position thereon. In this form, the weight 36 may be moved on the rod 35 and the shutter 32 balanced so as to be held in position with the passage in the member normally open. The passage in the member may be closed by moving the weight 36 on its rod 35 toward the shutter so that the inner end of the shutter will over-balance the outer end and weight, or a hook or other device, not shown, may be arranged to engage the outer end of the shutter to support the same.

While I have described the attachment for use in connection with oil burning furnaces, I wish it understood that the attachment may be used advantageously with a furnace having any gaseous or liquid burning device.

It is obvious that various changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not intend to be limited to the details herein shown and described except as the same are set forth in the claims.

What I claim is:

1. An air admission attachment for vertical tubular boilers including a firebox, a base therefor and an oil burning device in the base, said attachment comprising a straight open ended tubular member having the inner end of one of its walls cut away to form a longitudinal opening therein and secured to the boiler in position to project into the firebox for admitting air thereinto, and a gravity operated shutter pivoted adjacent the outer end of said member and adapted to be moved toward and away from said longitudinal opening in the wall of the member by the draught in the boiler to control the amount of air passing through the member to the firebox.

2. An air admission attachment for vertical tubular boilers including a firebox, a base therefor and an oil burning device in the base, said attachment comprising a straight open ended tubular member having the inner end of one of its walls cut away to form a longitudinal opening therein and secured to the boiler in position to project into the firebox for admitting air thereinto, a gravity operated shutter pivoted adjacent the outer end of said member and adapted to be moved toward and away from said longitudinal opening in the wall of the member by the draught in the boiler to control the amount of air passing through the member to the firebox, said shutter having its upper end extending outwardly from the tubular member, and a device arranged to engage said upper end of said shutter to hold it out of operation.

3. An air admission attachment for vertical tubular boilers including a firebox, a base therefor and an oil burning device in the base, said attachment comprising a straight open ended tubular member having the inner end of its lower wall cut away to form a longitudinal opening therein and secured to the boiler in position to project into the firebox for admitting air thereinto, and a counter-balanced gravity operated shutter pivoted adjacent the outer end of said member and adapted to be moved toward and away from said longitudinal opening in the lower wall of the member by the draught in the boiler to control the amount of air passing through the member to the firebox.

4. An air admission attachment for vertical tubular boilers including a firebox, a base therefor and an oil burning device in the base, said attachment comprising a straight open ended tubular member having its lower wall cut away to form a longitudinal opening therein and secured to the boiler in position to project into the firebox for admitting air thereinto, a counterbalanced gravity operated shutter pivoted adjacent the outer end of said member and adapted to be moved toward and away from said longitudinal opening in the lower wall of the member by the draught in the boiler to control the amount of air passing through the member to the firebox, said shutter having its upper end extending outwardly from the tubular member, and a device arranged to engage said upper end of said shutter to hold it out of operation.

5. An air admission attachment for vertical tubular boilers including a firebox, a base therefor and an oil burning device in the base, said attachment comprising a straight open ended tubular member having its lower wall cut away to form a longitudinal opening progressively increasing in width toward the inner end, said member being secured to the boiler in position to project into the firebox for admitting air thereinto, and a gravity operated shutter pivoted adjacent the outer end of said member and adapted to be moved by the draught in the boiler to control the amount of air passing through the member to the firebox.

6. An air admission attachment for vertical tubular boilers including a firebox, a base therefor and an oil burning device in the base, said attachment comprising a straight open ended tubular member having its lower wall cut away to form a longitudinal opening progressively increasing in width toward the inner end, said member being secured to the boiler in position to project into the firebox for admitting air thereinto, a gravity operated shutter pivoted adjacent the outer end of said member and adapted to be moved by the draught in the boiler to control the amount of air passing through the member to the firebox, and a device for engaging said shutter to hold it out of operation.

7. An air admission attachment for vertical tubular boilers including a firebox, a base therefor and an oil burning device in the base, said attachment comprising a straight open ended tubular member having its lower wall cut away to form a longitudinal opening progressively increasing in width toward the inner end, said member being secured to the boiler in position to project downwardly into the firebox for admitting and directing air toward the base, and a counterbalanced gravity operated shutter pivoted adjacent the outer end of said member and adapted to be moved by the draught in the boiler to control the amount of air passing through the member in the firebox.

8. An air admission attachment for vertical tubular boilers including a firebox, a base therefor and an oil burning device in the base, said attachment comprising a straight open ended tubular member having its lower wall cut away to form a longitudinal opening progressively increasing in width toward the inner end, said member being secured to the boiler in position to project downwardly into the firebox for admitting and directing air toward the base, counterbalanced gravity operated shutter pivoted adjacent the outer end of said member and adapted to be moved by the draught in the boiler to control the amount of air passing through the member in the firebox, and a device for engaging said shutter to hold it out of operation.

In testimony, that I claim the foregoing as my invention, I have signed my name this 25th day of October, 1929.

GUSTAVE LEIMAN.